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# ANDROID BASED AUTOMATIC FLOWERING OPTIMIZATION TOOLS

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**ABSTRACT**

The role of information technology is inseparable and very important in agriculture, both in the technical processing and marketing. The automated system acts as a medium for watering automation in flower gardens using android controls, thus helping flower farmers to work more effectively and efficiently, Where the system consists of control systems and execution systems. The control system consists of an android device and an application specifically made to control the execution system, The execution system consists of Arduino as a microcontroller, relay as a switch for the water pumping machine that will flow water to the flower plants through pipes and bluetooth as a media connection from the control system.

## INTRODUCTION

Flowers (Latin: flos) is a means of sexual reproduction in flowering plants or commonly called closed seed plants in which there are reproductive organs namely stamens and pistils that will produce seeds[1] the shape and color of the flower varies greatly, this is what causes the plant to look beautiful and beautiful. "Humans are so captivated by colorful flowers that have cultural significance"[2] But there are some varieties of flowers that are deliberately cultivated because they are rare, difficult to survive with different conditions and functions needed in large numbers, allowing flower gardeners to cultivate them in their gardens and yard as well as the purpose of cultivating the flower. There are some things that are very important to consider in the cultivation and care of ornamental flower plants including proportional supply of fertilizers, physical care by tuning even the temperature of humidity and also the most important source of life is the supply of water which is a need basic.

"Therefore, with the development of technology today is the progress of Android-based smart phones with unlimited features"[3], can be used as a control device that can help the activities of ornamental flower plant farmers in supplying water to the cultivation area without having to do direct watering. This enables farmers to freely optimize their "Android-based smart phones that have multitasking features" [4] by selling online while watering plants in the same place and with an efficient time through the smartphone's control. So from the above thought, the writer tries to design a system

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that is implemented on a device with the title "Optimization of Automatic Flowers Based on Android".

Based on the background above, the problem can be formulated as follows (1) How do you make an automatic watering device that can be controlled by an Android device? (2) How to build interfaces or applications with an Android system. (3) How to conImage the interface on Android with Arduino as an instruction processor

The scope of the discussion in this research is to discuss the control system and the characteristics of the tool, Only discuss the control of watering flowers using Android and only discuss the control of Android from a short distance.

In this study there are several objectives to be achieved (1) To be able to make automatic flower watering tools that can be controlled by an android device. (2) Build interfaces or applications with an Android system. (3) To be able to conImage the interface on Android with Arduino as an instruction processor.

The results of this study will be useful to assist and alleviate the work of flower farmers in performing maintenance, especially watering flowers that are done automatically.

**Optimization**

A process to achieve ideal results or optimization (effective value that can be achieved). Optimization can be interpreted as a form of optimizing something that already exists, or designing and making something optimally (Wikipedia)

***Mikrokontroler* Arduino Uno**

A microcontroller is a computer inside a chip that is used to control electronic equipment, which emphasizes efficiency and cost effectiveness. Literally it can be called a "small controller" where an electronic system that previously required a lot of supporting components such as IC TTL and CMOS can be reduced / reduced and finally centralized and controlled by this microcontroller. Arduino is an electronic circuit that is open source, and has hardware and software that are easy to use. Arduino can recognize the surrounding environment through various types of sensors and can control lights, motors, and various other types of actuators. Arduino has many types, including Arduino Uno, Arduino Mega 2560, Arduino Fio, and others [5].

**Bahasa C**

Procedural language that applies the concept of sequences (programs are executed per line from top to bottom in sequence), so if we write other functions below the main function, then we must write the prototype (prototype), this is intended to introduce first to The compiler lists the functions that will be used in the program. But if we write the other functions above or before the main function, then we no longer need to write the prototype section above [6].

**Android**

Android (/ˈæn.drɔɪd/; AN-droyd) is a Linux-based operating system designed for touch screen mobile devices such as smartphones and tablet computers. Android was

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originally developed by Android, Inc., with financial support from Google, who later bought it in 2005. The operating system was officially released in 2007.

**Bluetooth**

Bluetooth Module HC-05 is a wireless communication module on the 2.4GHz frequency with a choice of connections can be as a slave, or as a master. Very easy to use with a microcontroller to create wireless applications.

## METHOD

To help prepare research, a clear framework is needed. This framework is the steps that will be taken in solving problems. The following is the research framework carried out:

Bluetooth is a device that receives instructions from applications that are already embedded on Android, then will be forwarded as input to Arduino that will be processed according to the program, then the Arduino output pin is connected by relay, which relay functions to activate the water pump engine according to the instructions displayed on the application screen on Android. The illustration of how the tool that the author designed is as follows:

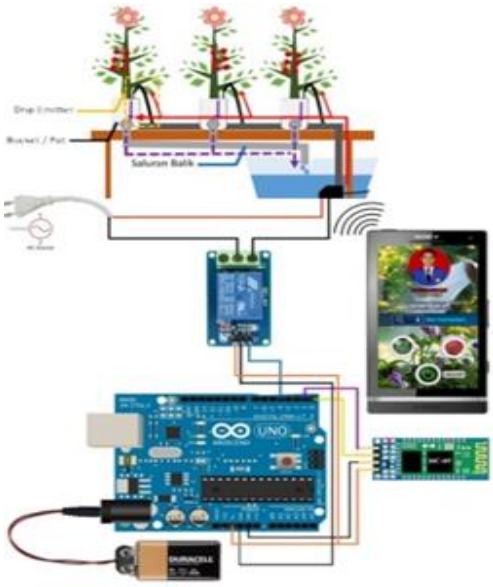

Image 1. The Complete Network of Control Systems

## RESULT AND DISCUSSION

It was explained that all data entered through the circuit, the input which functioned as a series of inputs and the data is then processed by Arduino Uno and the results of the

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process will produce output, so this detector can run according to human commands. The working system of this series of tools can be seen in the picture below:

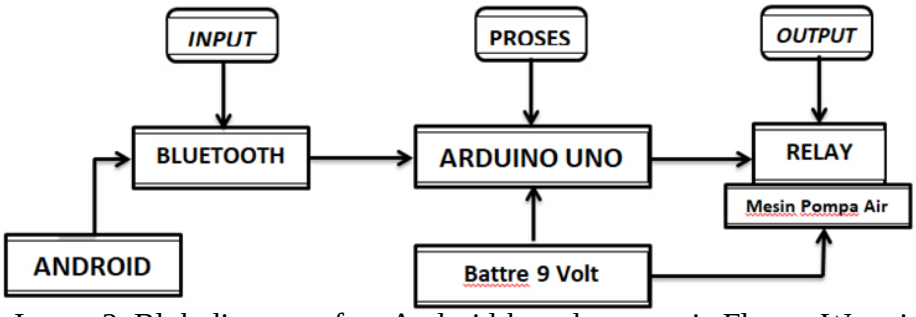


Image 2. Blok diagram of an Android-based automatic Flower Watering Tool

From the block diagram above, it can be explained that each function of the block for each component is:

1. Android functions as an input tool that will be accepted by Bluetooth.
2. Bluetooth functions as an instruction receiver which will forward the instructions to Arduino.
3. Arduino Uno functions to control the system and give commands to the output to be able to work in accordance with the expected work.
4. The 9 volt battery is to provide voltage to all hardware of the system.
5. The relay functions as a switch to activate the water pumping machine and then proceed through the hoses, in this case as an automatic watering device.

**Application Interface on Android**

The interface design or design solution is made to describe the application form of the automatic flower sprinkler application on android.

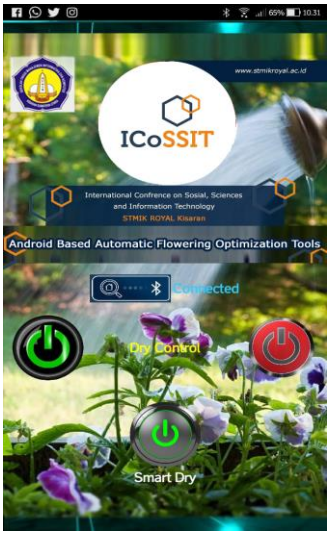


Image 3. Automatic Flower Watering Application Interface

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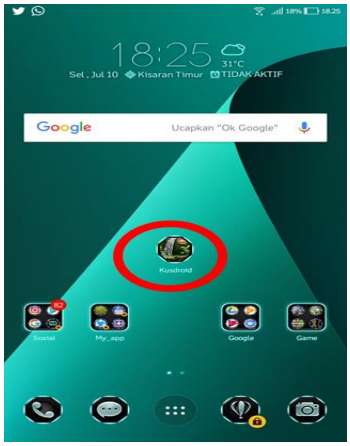


Image 4. Automatic Flower Watering Application Icon on the Andoid Screen

This research discusses the steps of testing a series of tools and programs used**.** The aim is to find out whether the tool works as desired**.** The pictures from the results of testing the application connection on Android by using Bluetooth HC-05 on the prototype tool as follows**:**

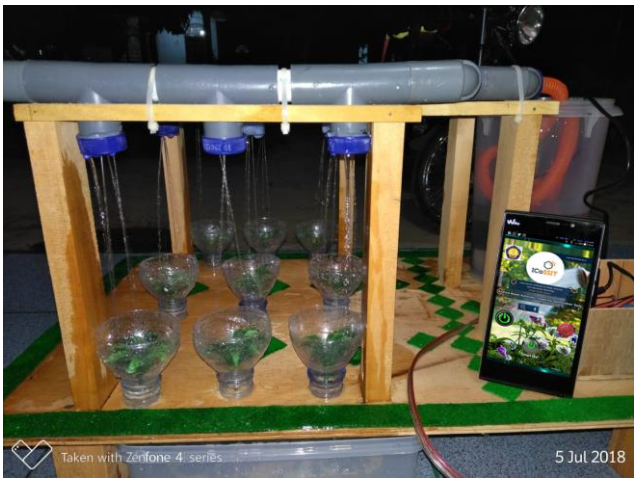


Image 5. Android-based Automatic Flower Watering System and Prototype
Prototype Technical Testing

To be able to see the extent of success in running the system, then here the author makes a prototype or miniature that is made as closely as possible to the reality**,** which is a model of a hydroponic flower garden. Where after the hardware series gets instructions from Android**,** then the water machine will live and drain the water into the pipes that directly lead to each flower plant**,** then the authors design the watering radiates from the top of the flower, with the following objectives**:**

1. In order not to damage the soil surface in flower pots with high water volume because it uses a direct hose.
2. In order for the even distribution of water in all parts of the flower plant

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3. To clearly prove the operation of the automatic watering system by spreading water through pipes to flower plants
4.

Image 6. Drainage or path of watering the Prototyp

## CONCLUSION

Based on the results of research and discussion, it can be concluded that the tool designed has fully run in accordance with what the authors expect in this study and the system runs according to user needs, namely flower farmers in terms of helping to lighten the process of watering flowers by utilizing Android and the prototype used can be implemented in a real state of reality. and not only flower gardens but other plantations.

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